

TYPHOON JOE (15W)

During the month of October, tropical cyclone activity in the western Pacific was concentrated in the South China Sea. Six tropical cyclones formed between 29 September and 26 October in the western Pacific. Five of the six, formed as tropical depressions in the Philippine Sea and crossed the Philippines prior to intensifying in the South China Sea. All five moved westward without recurving. Typhoon Joe (15W) was the most intense of these and the only one of the five to achieve typhoon intensity.

Joe's origins can be traced back to 6 October when it was detected as a tropical disturbance located well to the south of Guam. It was first discussed on the Significant Tropical Weather Advisor (ABEH PGTW) on the following day and was monitored by JTWC as it moved westward. At 090000Z October, synoptic data indicated that the MSLP in the disturbance was near 1006 mb and that a closed surface circulation was developing. Winds of up to 25 kt (13 m/s) were estimated from satellite analysis as convective cloudiness and organization increased. A TCFA was issued at this time in anticipation of continued intensification. The area covered by the alert was later shifted southward when satellite imagery indicated that the predominant circulation center was forming well to the south of the areas that had previously been fixed. Satellite fixes were now scattered over an area that was too large to be accounted for by either storm movement or nominal position error. The presence of mul-

tiple circulation centers was considered as a possible explanation for this excessive fix scatter.

An aircraft investigation of the area, completed at 100204Z, revealed a closed circulation center with a central pressure of 1003 mb and 30 kt (15 m/s) winds. The mission ARWO (Aerial Reconnaissance Weather Officer) reported that he suspected the presence of multiple centers, but was unable to locate any other areas of light and variable winds that would be associated with such centers.

The following aircraft reconnaissance mission also encountered perturbations in the wind field which indicated the possibility of multiple circulations. Figure 3-15-1 shows Joe as a tropical depression at the time of this mission. The arrow marks the position of the surface circulation located by aircraft. The position of the dominant circulation is not apparent from this imagery, nor is it possible to confirm the presence of multiple circulations. Synoptic data was also inadequate to afford recognition of multiple centers. Figure 3-15-2 is the surface analysis at 100000Z. Major features, such as Typhoon Ida located south of Japan, and the remains of Tropical Storm Herbert located over Indochina, are well defined. Joe appears as a tropical depression in the Philippine Sea, but data density is not sufficient to prove or disprove the presence of multiple circulations.

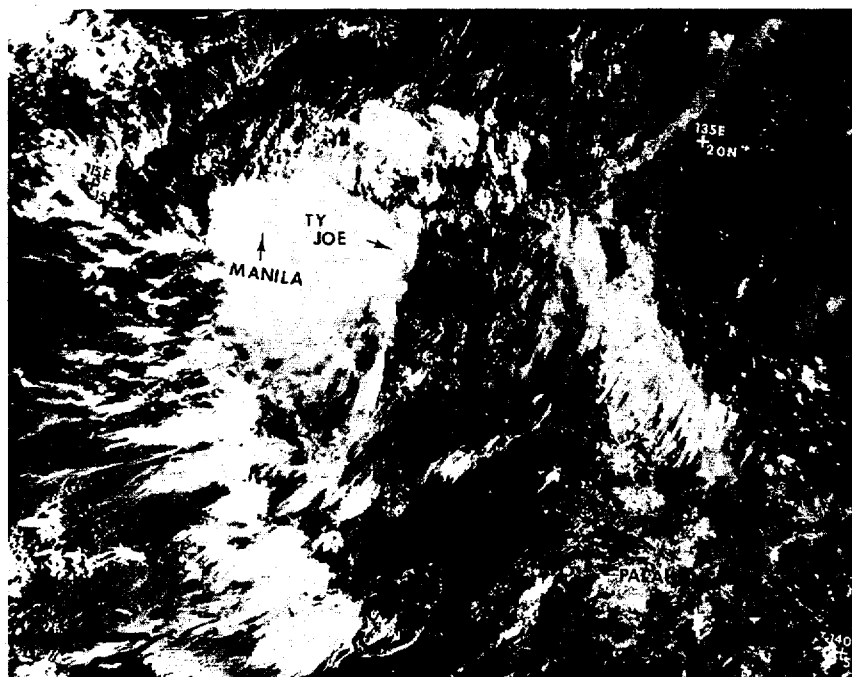


Figure 3-15-1. Satellite imagery at the time of the aircraft reconnaissance mission. (100650Z October NOAA 7 visual imagery).

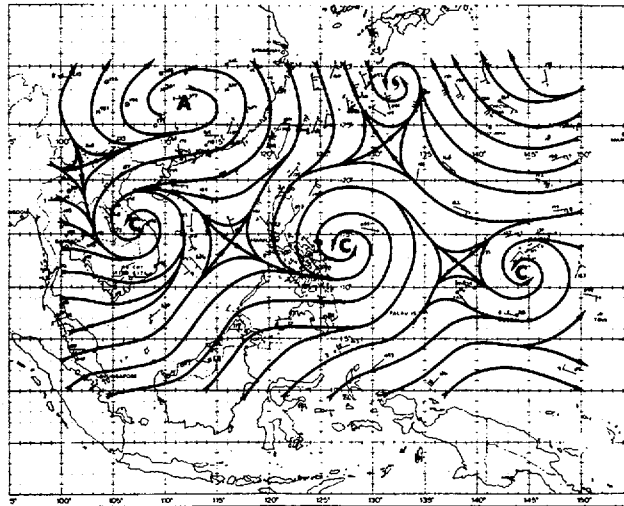


Figure 3-15-2. Surface analysis for 100000Z October showing Typhoon Ida (14W), Tropical Storm Herbert (13W), and Joe (15W) as a tropical depression in the Philippine Sea.

Joe remained poorly organized over the next 24 hours. Figure 3-15-3 illustrates the upper-level conditions which greatly affected Joe's intensity. Strong northeasterly flow to the south of the anticyclone centered near Okinawa created a shearing environment which inhibited Joe's development. This condition, combined with rapid movement over the next 24 hours, resulted in Joe approaching the Philippines as a 30 kt (15 m/s) depression with no increase in organization of intensity. As Joe crossed central Luzon, synoptic data and radar reports indicated that the system was still poorly organized.

After emerging in the South China Sea,

Joe became better organized and intensified as it moved in a wide anticyclonic track around the western periphery of the subtropical ridge. Upper-level flow patterns at this time (Figure 3-15-4) were favorable for Joe's development and allowed the formation of well-defined outflow channels to the northeast and southwest. Figure 3-15-5 shows Joe near maximum intensity. Note the symmetrical and unrestricted outflow pattern.

Joe continued to intensify as it moved northwestward reaching a maximum intensity of 65 kt (33 m/s) six hours prior to landfall. Joe dissipated rapidly after moving inland over southern China approximately 100 nm (185 km) west of Hong Kong.

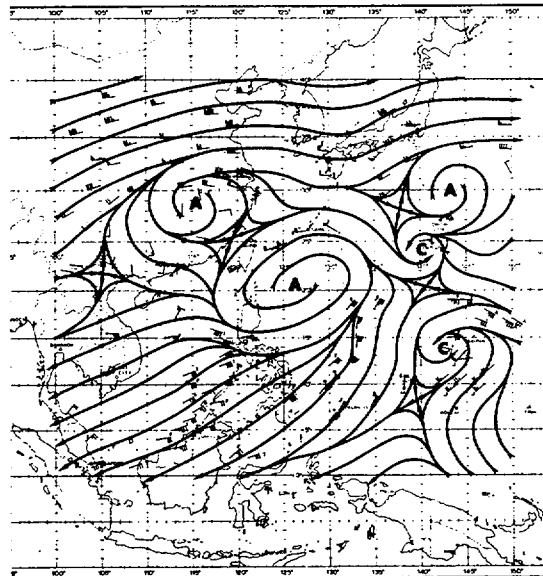


Figure 3-15-3. 200 mb analysis for 100000Z October. Note the strong northeasterly flow in the vicinity of the Philippines.

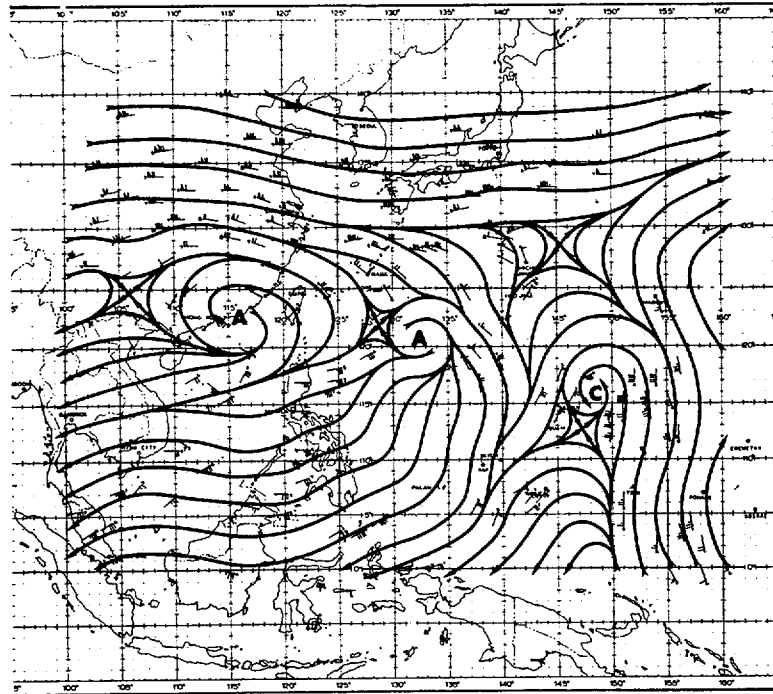


Figure 3-15-4. 200 mb analysis at 131200Z October. Comparison with Figure 3-15-3 shows a displacement of the anticyclone to the north of Joe which allowed the development of outflow channels to the northeast and southwest.

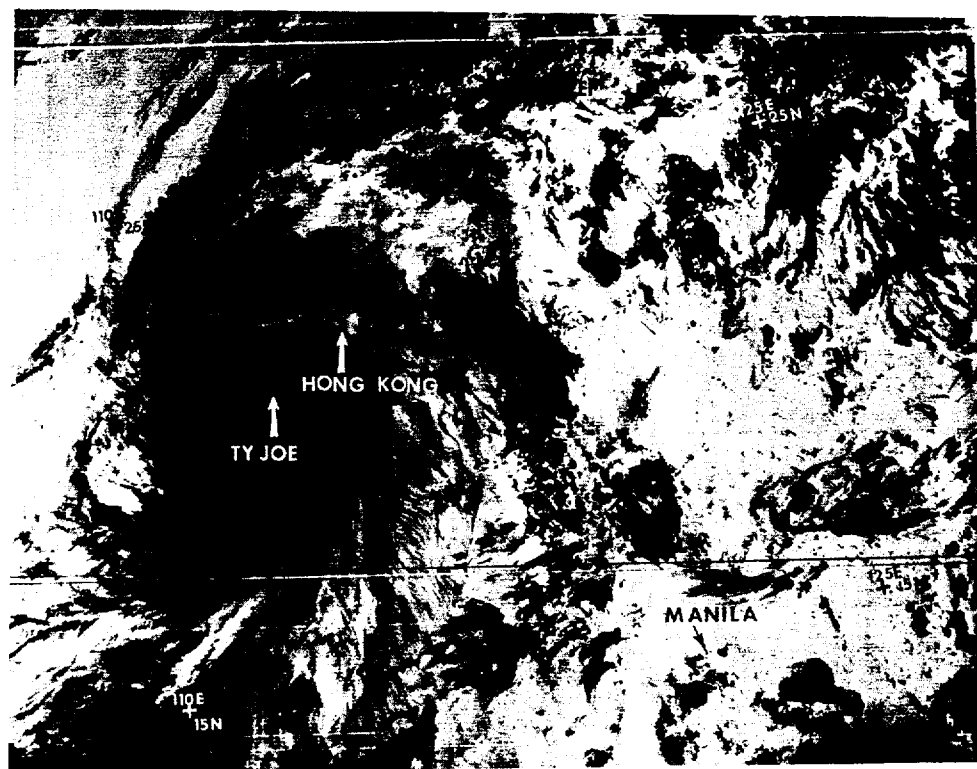


Figure 3-15-5. Typhoon Joe at maximum intensity three hours prior to landfall (131034Z October DMSP infrared imagery).